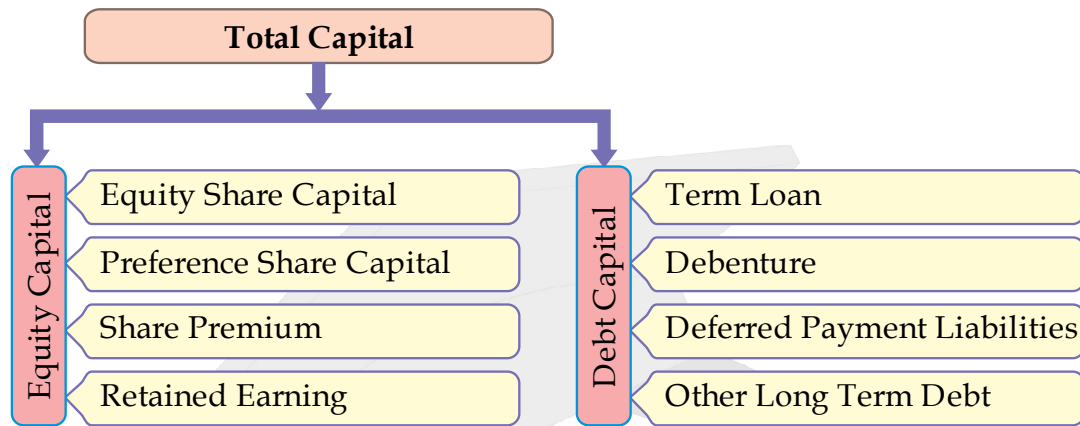# 4. Capital Structure

Capital Structure ordinarily implies the proportion of Debt and equity in the total of the company. The term capital may be defined as long term funds of the firm. Capital defines as sources of fund which express left hand side of Balance sheet. Capital may be categorized into equity and debt.

```
                        ┌─────────────────┐
                        │  Total Capital  │
                        └─────────────────┘
                                │
          ┌─────────────────────┴─────────────────────┐
          │                                           │
┌─Equity Capital─┐                          ┌─Debt Capital─┐
│ Equity Share Capital                      │ Term Loan
│ Preference Share Capital                  │ Debenture
│ Share Premium                             │ Deferred Payment Liabilities
│ Retained Earning                          │ Other Long Term Debt
```

Capital structure is defined is two Ways. According to some authors capital structure refers to the relationship between the long term debt and equity. In other words, it takes in to consideration only the long term sources of capital. It excludes short term capital from its purview. The RBI and the All India Financial Institutions also use the term of capital structure of companies basing on the relation between long term debt and equity.

Capital structure refers mix of owner fund and outsider fund or its proportionate relationship of the equity and debt. The capital structure of the decision important of the firm and maximum value of the firm. If higher debt fund in capital structure give greater financial risk and provide higher cost of capital so firm should try minimum capital structure keeping in view value maximization objective of firm.

Ques. *The term capital structure implies :*   **(NTA UGC-NET Dec. 2015 P-II)**

    (A)   *Share Capital + Reserves + Long-Term Debts*

    (B)   *Share Capital + Long and Short-Term Debts*

    (C)   *Share Capital + Long-Term Debts*

    (D)   *Equity and Preference Share Capital*

Ans.   *(A)*   *Share Capital + Reserves + Long-Term Debts*

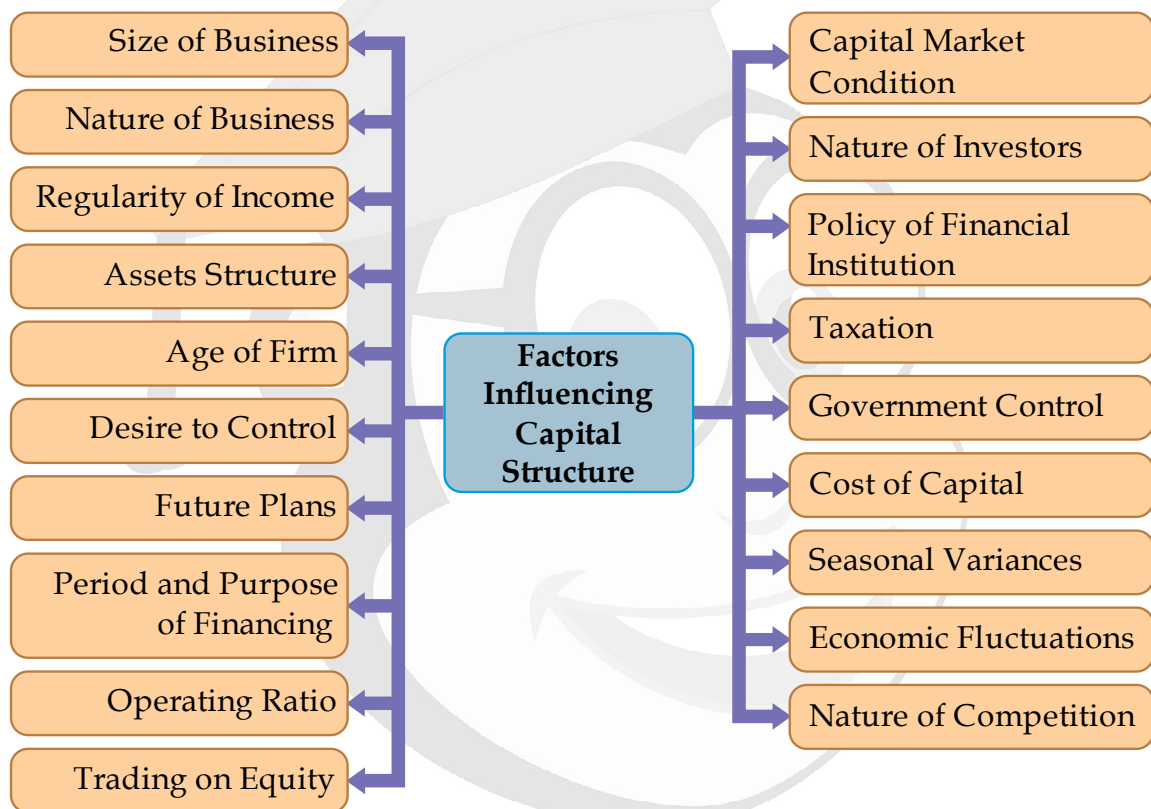*Ques.* *Debt financing is a cheaper source of finance because of*   **(NTA UGC-NET Jan. 2017 P-II)**

    (A)   *Time value of money*

    (B)   *Rate of interest*

    (C)   *Tax deductibility of interest*

    (D)   *Dividends are not payable to lenders*

Ans.   *(C)*   *Tax deductibility of interest*

Capital Structure, Capitalization and Financial Structure

- **Capitalization** refers to the total amount of securities issued by a company. Capitalization is a quantitative aspect of the financial planning of an enterprise.
- **Capital Structure** refers to the kinds of securities and the proportionate amounts that make up capitalization. Capital structure is concerned with the qualitative aspect.
- **Financial Structure** refers to all the financial resources of the firm. It represents the whole liabilities side of the Position statement, i.e. Balance Sheet, which includes both long term and long term debt and current liabilities.

Factors That Influences Capital Structure

	Factors Influencing Capital Structure	
Size of Business		Capital Market Condition
Nature of Business		Nature of Investors
Regularity of Income		Policy of Financial Institution
Assets Structure		Taxation
Age of Firm		Government Control
Desire to Control		Cost of Capital
Future Plans		Seasonal Variances
Period and Purpose of Financing		Economic Fluctuations
Operating Ratio		Nature of Competition
Trading on Equity		

General Assumption in Capital Structure Theories

- The firm has only two sources of funds, debt and ordinary share.
- There are no tax.
- The investment decision of a company is consent that firm does not invest in all assets.
- Firm put off the entire earning to its equity holders and retained earnings are zero.
- The operating profits EBIT are not expected to increase or decrease.
- Life of firm is indefinite.
- The business risk assumed to be constant and is not affected by financing mix decision.

Net Income Approach (NI Approach)

This approach is given by **'Durend David'**. *It is also known as fixed theory.* The theory suggests increasing value of the firm by decreasing the overall cost of capital which is measured in terms of Weighted Average Cost of Capital. This can be done by having a higher proportion of debt, which is a cheaper source of finance compared to equity finance. Any change in the financial leverage will have a correspondence change in the overall cost of capital and also total value of the firm.

According to Net Income Approach, change in the financial leverage of a firm will lead to a corresponding change in the Weighted Average Cost of Capital (WACC) and also the value of the company. The Net Income Approach suggests that with *the increase in leverage (proportion of debt), the WACC decreases and the value of firm increases. On the other hand, if there is a decrease in the leverage, the WACC increases and thereby the value of the firm decreases.*

> *Assumption*
> - *Cost of debt less than cost of the Equity.*
> - *Income tax has been ignored.*
> - *Cost of the debt Capital of equity Capital remains constant.*

Fig. : Net Income Approach
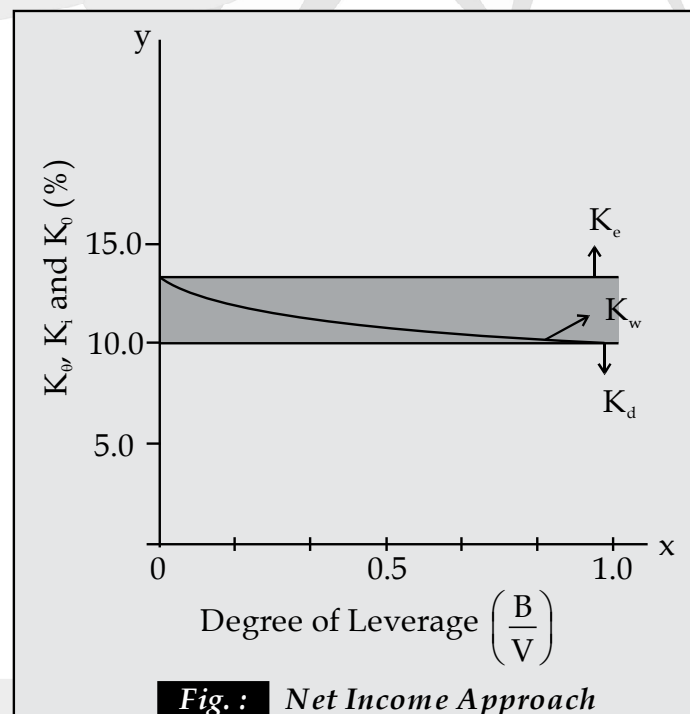
Computation : *Under Net Income (NI) theory the total value of a firm is computed by adding the market value of debt in the capitalized value of earnings available for equity shareholders. Expressed as a formula :*

> Total Value of Firm = Market Value of Equity + Market Value of Debt
> = S + D

The market value of shares (S) is calculated by the following formula :

$$S = \frac{E}{K_e} \quad \text{or} \quad \frac{EBIT - I}{K_e}$$

where; E = Earnings available for equity shareholders

EBIT = Earnings before Interest and Tax

K_e = Equity Capitalization Rate or Cost of Equity Capital

The **Overall Cost of Capital or Capitalization Rate** K_o is calculated by using the following formula :

$$\text{Overall Capitalization Rate} = \frac{\text{Earnings}}{\text{Value of the Firm}}$$

$$K_o = \left(\frac{\text{EBIT}}{V}\right)$$

Ques. *"The cost of capital declines when the degree of financial leverage increases." Who advocated it ?*

(NTA UGC-NET Dec. 2012 P-III)

(A)   *Net operating income approach*   (B)   *Net income approach*

(C)   *Modigliani-Miller approach*   (D)   *Traditional approach*

Ans.   (B)   *Net income approach*

Example : Ram Limited expects annual net income (EBIT) of Rs. 2,00,000 and equity capitalization rate of 10%. The Company has Rs. 6,00,000 debentures with an annual interest rate of 8%. There is no corporate income tax. Calculate the value of the firm and overall (weighted average) cost of capital according to the Net Income Theory.

Solution : Calculation of the Value of the Firm

	Rs.
Net Income (EBIT)	2,00,000
Less : Interest on 8% Debentures of Rs. 6,00,000 (I)	48,000
Earnings available to equity shareholders (E)	1,52,000
Equity Capitalization Rate (K_e)	10%
Market Value of Equity (S)	

$$\frac{E}{K_e} = \frac{1,52,000}{10\%} \qquad\qquad 15,20,000$$

Add: Market Value of Debentures (D)   6,00,000

Total value of the firm (V)   21,20,000

Overall Cost of Capital (K_o)

$$= \frac{\text{Earnings}}{\text{Value of the firm}} \text{ or } \frac{\text{EBIT}}{V}$$

$$= \frac{\text{Rs. } 2,00,000}{\text{Rs. } 21,20,000} \times 100 = 9.43\%$$

Net operating Income Approach (NOI Approach)

This approach was also suggested by **'Durent David'** and it's totally opposite of Net Income approach. According this theory total market value of the firm (V) is not affected by the change in the Capital Structure and overall cost of the capital (K_o). *Market value of firm depends upon the net operating profit or EBIT.* WACC is constant at all levels. There is no optimal Capital structure since these will be change in risk of the shareholders due to change in debt / equity mix therefore K_e is changing linearly with change in debt proportion.

Assumption

● *The cost of debt (K_d) is less than cost of the equity (K_e).*
● *Cost of the debt (K_d) remains Constant at various level of debt equity mix.*
● *No corporate tax.*
● *Overall cost (K_o) of the firm is constant and depend upon the business risk which also is assumed to be unchanged.*
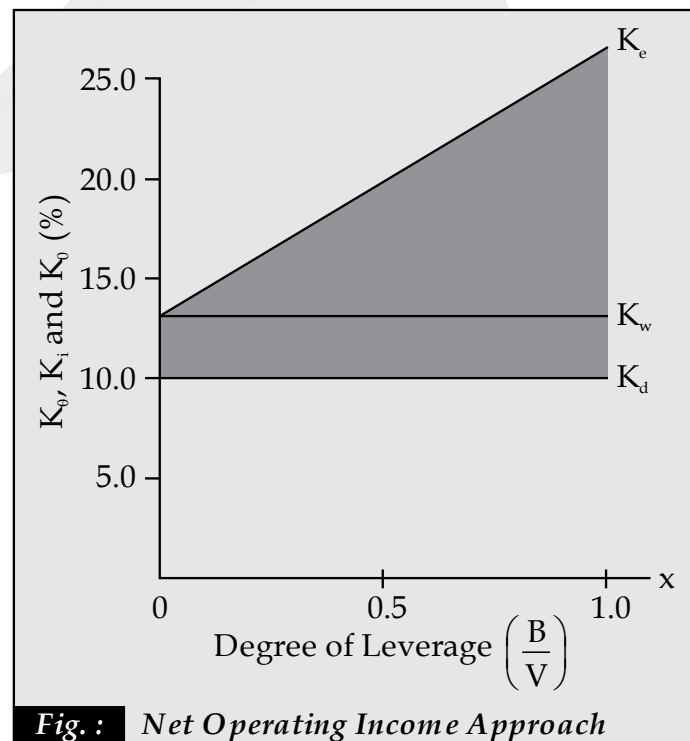

Fig. : *Net Operating Income Approach*

Market Value of Equity Capital (S) is calculated by deducing the market value of debt (D) from the total value of the firm (V) i.e. (S = V – D). The cost of equity capital (Ke) is calculated by using the following formula:

$$K_e = \frac{EBIT - I}{S \text{ or } (V - D)}$$

where; K_e = Equity Capitalization Rate or Cost of Equity

EBIT = Earnings before Interest and Tax

I = Interest on Debt

S = Value of Equity

Example : TATA ltd. expects annual net operating income of Rs. 4,00,000. It has Rs. 10,00,000 outstanding debts; cost of debt is 10%. If the overall Capitalization rate is 12.5% what would be the total value of the firm and the equity capitalization rate according to Net Operating Income Theory.

Solution : Calculation of Total Value of the Firm and Equity Capitalization Rate

	Rs.
Net Operating Income (EBIT)	4,00,000
Int. on Debt of Rs. 10,00,000 @ 10%(I)	1,00,000
Overall Capitalization Rate (K_o)	12.5%
Total Value of the Firm (V)	

$$\frac{EBIT}{K_o} = \frac{Rs.\ 4,00,000}{12.5\%}$$

32,00,000

Total Market Value of Debt (D)   10,00,000

Total Market Value of Equity (S) = (V - D)
22,00,000

Equity Capitalization Rate (K_e)

$$\frac{EBIT - I}{S} = \frac{Rs.\ 4,00,000 - Rs.\ 1,00,000}{Rs.\ 22,00,000} = 0.1364$$

or   13.64%

Ques. *The overall capitalization rate and the cost of debt remain constant for all degrees of financial leverage is advocated by*   ***(NTA UGC-NET June 2012 P-III)***

    (A)   *Traditional Approach*   *(B)*   *Net Income Approach*

    (C)   *Net Operating Income Approach*   *(D)*   *M-M-Approach*

Ans.   *(C)*

Traditional Approaches

This approach is a medium between the NI and NOI approaches. **Ezta Solomon and Fred Weston** is a midway approach which is also known as **intermediate approach**. According to this approach a firm can reduce the overall cost of capital or increase total value of firm by increasing the debt proportion in certain limit. Beyond certain limit value of firm may decrease and cost of overall may increase. Hence a firm has an optimum Capital structure that occurs when cost of overall (K_o) is Minimum and Maximum value of the firm. Changes in capital structure on the overall cost of capital (K_o) and total value of the firm (V) in following stages.

In first stage use of debt in capital structure increases the value of firm (V) and decrease overall cost of capital (K_o) because cost of equity (K_e) remain constant.

In second stage, beyond the use of debt of certain limit, value of firm (V) may decrease and cost of overall (K_o) may increase because cost of equity (K_e) increases.

Assumptions
- *The rate of interest on debt remains constant for a certain period and thereafter with an increase in leverage.*
- *The expected rate by equity remains constant or increase gradually. After that, the equity shareholders start perceiving a financial risk and then from the optimal point and the expected rate increases speedily.*
- *As a result of the activity of rate of interest and expected rate of return, the WACC first decreases and then increases. The lowest point on the curve is optimal capital structure.*

Fig. : **WACC and Optimum Leverage**
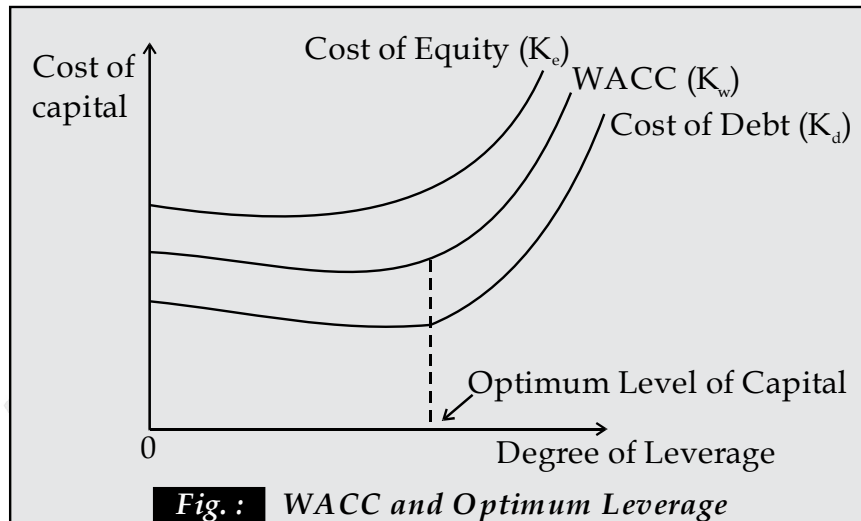
MM Approaches

Modigliani and Miller **approach** to **capital** theory, devised in the 1950s advocate's **capital structure** irrelevancy theory. This suggests that the valuation of a firm is irrelevant to the **capital structure** of a company. Whether a firm is highly leveraged or has lower debt component, it has no bearing on its market value. Rather, the market value of a firm is dependent on the operating profits of the company.

Modigliani Miller (M-M) do not agree with traditional approach, they argues that in perfect capital market without taxes and transactions cost a firms market value(V) and cost of capital(Kc) remain invariant and capital Structure changes. The value of the firm depends on earning and risk of its assets (business risk).

Modigliani and Miller Approach indicates that value of a leveraged firm (a firm which has a mix of debt and equity) is the same as the value of an unleveraged firm (a firm which is wholly financed by equity) if the operating profits and future prospects are same. That is, if an investor purchases shares of a leveraged firm, it would cost him the same as buying the shares of an unleveraged firm

This theory is based on following assumption :
- *Perfect Capital Market both individuals and investors can borrow unlimited amounts at same rate of interest.*
- *The investors are free to buy and sell of securities.*
- *These are no transaction cost and no brokerage.*
- *Debt is less expensive than equity.*
- *Interest rate is equal between borrowing and lending firm and individuals.*
- *There are no personal taxes and corporate income tax.*
- *All earning shall be distributed to shareholders there will be no retained Earnings.*

In Absence of Corporate Tax

Proposition 1 : *According these assumptions of "no taxes", the capital structure does not influence the valuation of a firm.* In other words, leveraging the company does not increase the market value of the company. It also suggests that debt holders in the company and equity shareholders have the same priority i.e. earnings are split equally amongst them.

Proposition 2 : *Under this approach financial leverage is in direct proportion to the cost of equity. With an increase in debt component, the equity shareholders perceive a higher risk for the company.* Hence, in return, the shareholders expect a higher return, thereby increasing the cost of equity. We assume that debt-shareholders have upper-hand as far as the claim on earnings is concerned. Thus, the cost of debt reduces.

With the Tax (Trade-OFF Theory of Leverage)

The Modigliani and Miller Approach assume that there are no taxes. But in the real this is far from the truth. Most countries collect and promote taxes. This theory **recognizes the tax benefits accrued by interest payments**. Interest paid on debt is tax deductible so actual cost of debt is less than the nominal cost of the debt and the value of the firm will increase and cost of capital will decrease with the increase of debt in **Capital Structure because debt (value of leveraged) is greater than the value of equity (value of unlevered) of firm**. This means higher the debt, lower is the WACC. This Modigliani and Miller approach is one of the modern approaches of Capital Structure Theory.

Fig. : *Leverage and Cost of Capital (MM Approach)*
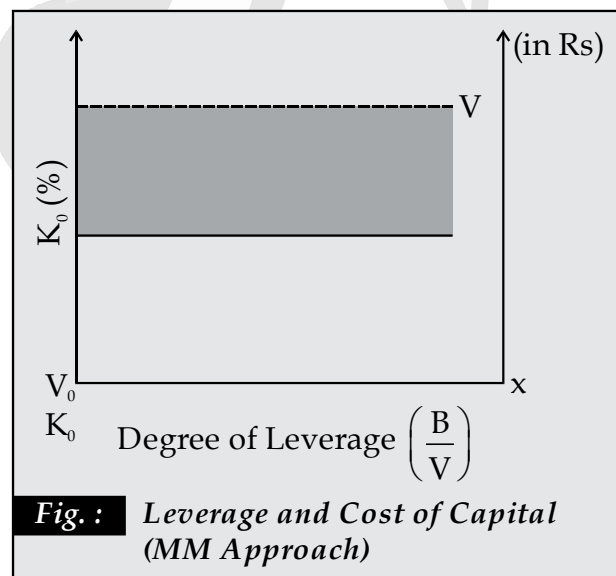
Corporate Taxes Exist

Value of Unlevered Firm

$$V_u = \frac{\text{Earnings after tax but before Interest}}{\text{After tax Capitalisation Rate}} \quad \text{or} \quad \frac{\text{EBIT }(1-T)}{K_e}$$

Value of Levered Firm

$$V_i = V_u + Dt \quad \text{or} \quad \frac{\text{EBIT }(1-T)}{K_e} + Dt$$

where V_i = Value of levered firm

V_u = Value of unlevered firm

D = Amount of Debt

t = tax rate

Example : There are two firms M and N which are exactly identical except that M does not use any debt in its financing, while N has Rs. 4,00,000 10% debentures in its financing. Both the firms have earnings before interest and tax of Rs. 3,20,000 and the after tax capitalization rate is 16%. Assuming the corporate tax of 50%, calculate the value of the firm according to M-M hypothesis.

Solution : The market value of firm M (unlevered) which does not use any debt

$$V_u = \frac{EBIT\ (1 - T)}{K_e}$$

$$= \frac{Rs.\ 3,20,000\ (1 - 0.50)}{16\%}$$

$$= \frac{Rs.\ 3,20,000 \times 0.5}{0.16} = Rs.\ 10,00,000$$

The market value of firm N (levered) which used debt finance of Rs. 4,00,000.

$$V_l = V_u + Dt$$
$$= Rs.\ 10,00,000 + 4,00,000 \times 0.5$$
$$= Rs.\ 10,00,000 + 2,00,000$$
$$= Rs.\ 12,00,000$$

Conclusion : The excess of higher value of firm Q Rs. 2,00,000 (Rs. 12,00,000 - Rs.10,00,000) is equal to the present value of saving (20,000/10%) due to taxation of Rs. 20,000 (Rs. 40,000 × 0.5) and interest of Rs. 40,000.

Arbitrage Process

The process of buying an assets or security in one market and selling in another market to get benefit from the price differential is referred as 'arbitrage'. Arbitrage use is technically where two identical commodities are selling in same market for different price than market reach equilibrium.

According MM approach the process of arbitrage will prevent different market value for equivalence because if two firms with same level of business risk but different level sold for different value shareholder would move from overvalued firm to undervalued firm and adjust their level of borrowing through market to maintain financial risk at same level.

Ques. Which one of the following is not among the assumptions of the Modigliani-Miller model ?

(NTA UGC-NET Dec. 2013 P-II)

(A)	*Perfect capital market*	(B)	*Equivalent risk classes*
(C)	*Unity for dividend payout ratio*	(D)	*Absence of taxes*

Ans. (C) *Unity for dividend payout ratio*

Ques. 'That personal leverage can replace corporate leverage' is assumed by

(NTA UGC-NET Jan. 2017 P-III)

(A)	*Traditional Approach*	(B)	*M M Model*
(C)	*Net Income Approach*	(D)	*Net Operating Income Approach*

Ans. (B) *M M Model*